



RESEARCH DEPARTMENT

Transmitting aerials for the Rosemarkie television and v.h.f. sound station

REPORT No.E-093
1963/57

**THE BRITISH BROADCASTING CORPORATION
ENGINEERING DIVISION**

RESEARCH DEPARTMENT

**TRANSMITTING AERIALS FOR THE ROSEMARKIE TELEVISION
AND V.H.F. SOUND STATION**

Report No. E-093
(1963/57)

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INTRODUCTION

The effective radiated power (e.r.p.) of the Band I installation at Rosemarkie has been increased in order to give a service comparable with that of the ITA station at Mount Eagle. The required 11 dB increase in mean e.r.p. was achieved by doubling the number of aerial tiers, and by the use of a higher power transmitter. During the modifications the opportunity was taken to rotate the horizontal radiation pattern (h.r.p.) so as to direct the principal maximum towards Glen Docherty, (an intermediate link site for feeding programme to the proposed television relay stations at Melvaig and on Skye). The modifications were carried out in stages during 1963 and completed in October 1963.

SUMMARY OF INSTALLATION

<u>Site:</u>	The site is at Ethie Hill, 12 miles (19 km) north-east of Inverness, grid ref: NH/762623, height 684 ft (209 m) a.m.s.l.
<u>Support Structure:</u>	The support structure consists of a 350 ft (107 m) stayed mast of 4 ft (1.22 m) square cross section with provision for a 60 ft (18.3 m) cantilever topmast for a future u.h.f. aerial. The mast is oriented with one stay on a bearing of 28° ETN.
<u>General Arrangement:</u>	See Fig. 1.
<u>Band I</u>	
<u>Channel:</u>	Channel 2, with horizontal polarization, is used. The vision carrier is offset -6.75 kc/s and the sound carrier -20 kc/s.
<u>Aerial:</u>	The aerial is an eight-tier 'Unipole-V', i.e. each tier consists of two radial unipoles mounted normal to the mast faces on bearings 73° and 163° ETN and fed with equal currents in anti-phase. The inter-tier spacing on each half-aerial is 0.5λ and the mean height of the complete aerial 232 ft (71m) a.g.l.

Power:	A 4 kW transmitter under-run at 3 kW is used.		
Templet and Horizontal Radiation Pattern (h.r.p.):	See Fig. 2 and Note 1.		
Gain:	Mean intrinsic gain		6.7 dB
	Mean net gain		6.2 dB
	<u>Deduct:</u> loss in feeder (type HM11)	0.6 dB	
	network loss	0.4 dB	1.0 dB
	Mean effective gain		<u>5.2 dB</u>

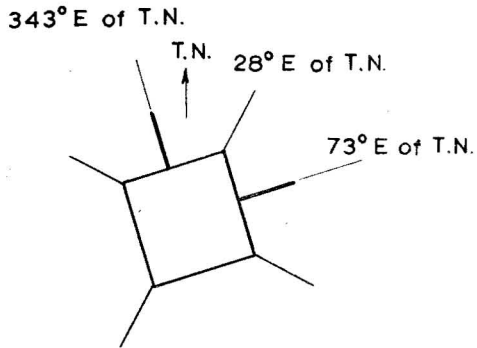
Band II

Carrier Frequencies:	89.6 (Light), 91.8 (Third), 94.0 (Scottish Home) Mc/s.		
Aerial:	The aerial is an eight-tier 'Unipole-V', i.e. each tier consists of two radial unipoles mounted normal to the mast faces on bearings 73° and 343° ETN and fed with equal currents in anti-phase. The inter-tier spacing is 0.5λ and the mean height 302 ft (92 m) a.g.l.		
Power:	Two transmitters, each with an output power of 1 kW, are used for each programme.		
H.R.P.:	See Fig. 3 and Note 1.		
Gain:	Mean intrinsic gain		6.7 dB
	Mean net gain		6.2 dB
	<u>Deduct:</u> loss in feeder (type HM11)	1.0 dB	
	network loss	0.5 dB	1.5 dB
	Mean effective gain		<u>4.7 dB</u>

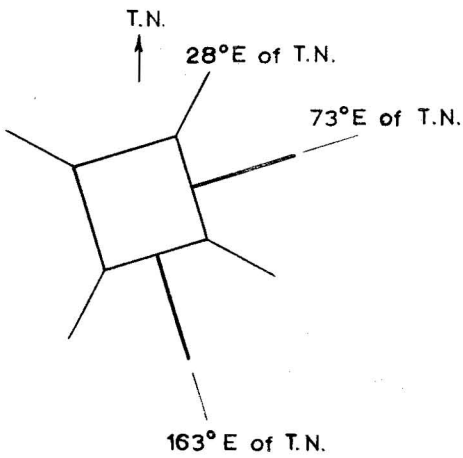
Programme Links: The television and v.h.f. sound transmissions from Meldrum are received at Fochabers and fed by G.P.O. microwave link to Rosemarkie.

Notes: 1. This aerial is an existing well-known type for which the h.r.p. has been determined precisely from measurements on small-scale models.

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Plan of Band II aerial



Plan of Band I aerial

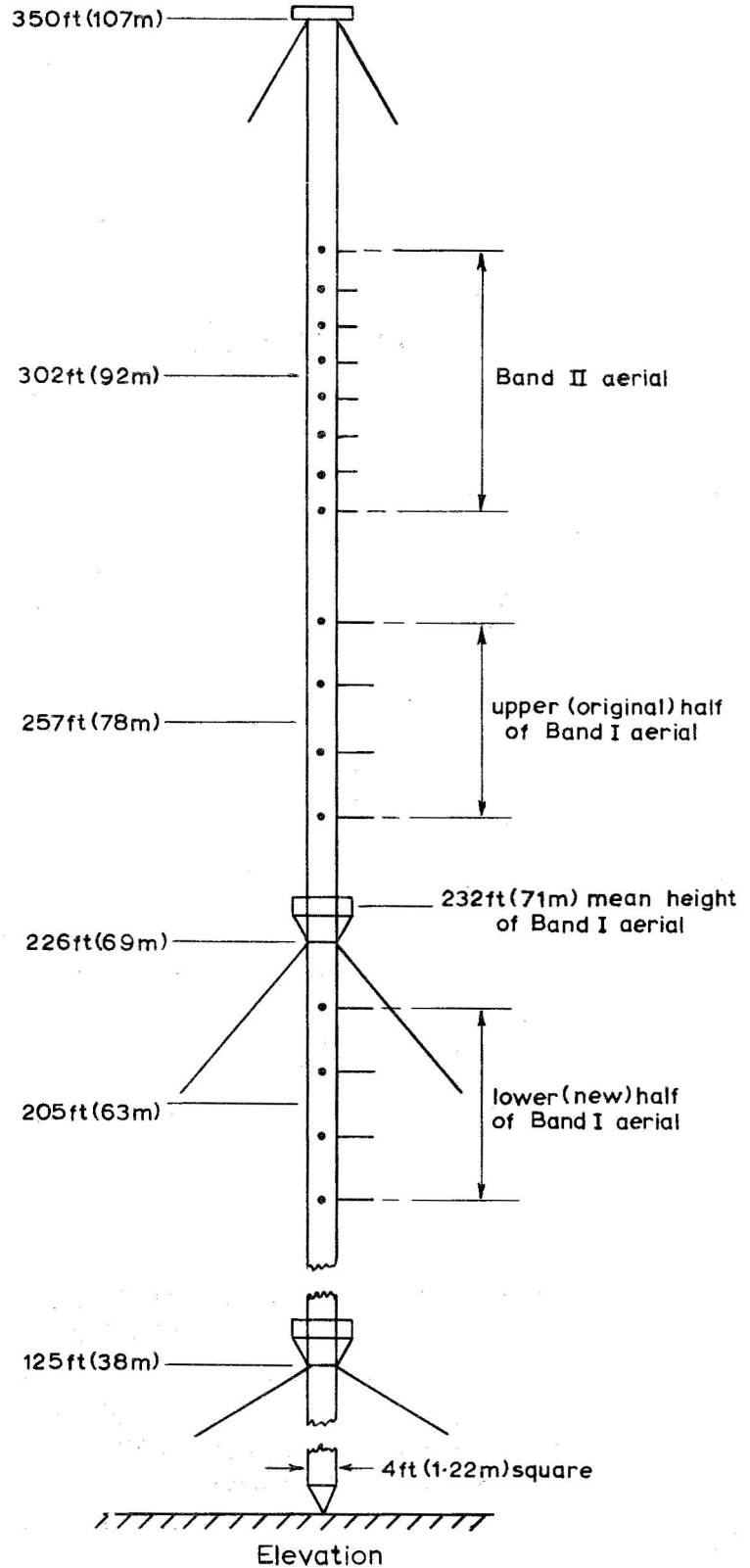


Fig.1 General arrangement of aerals on mast

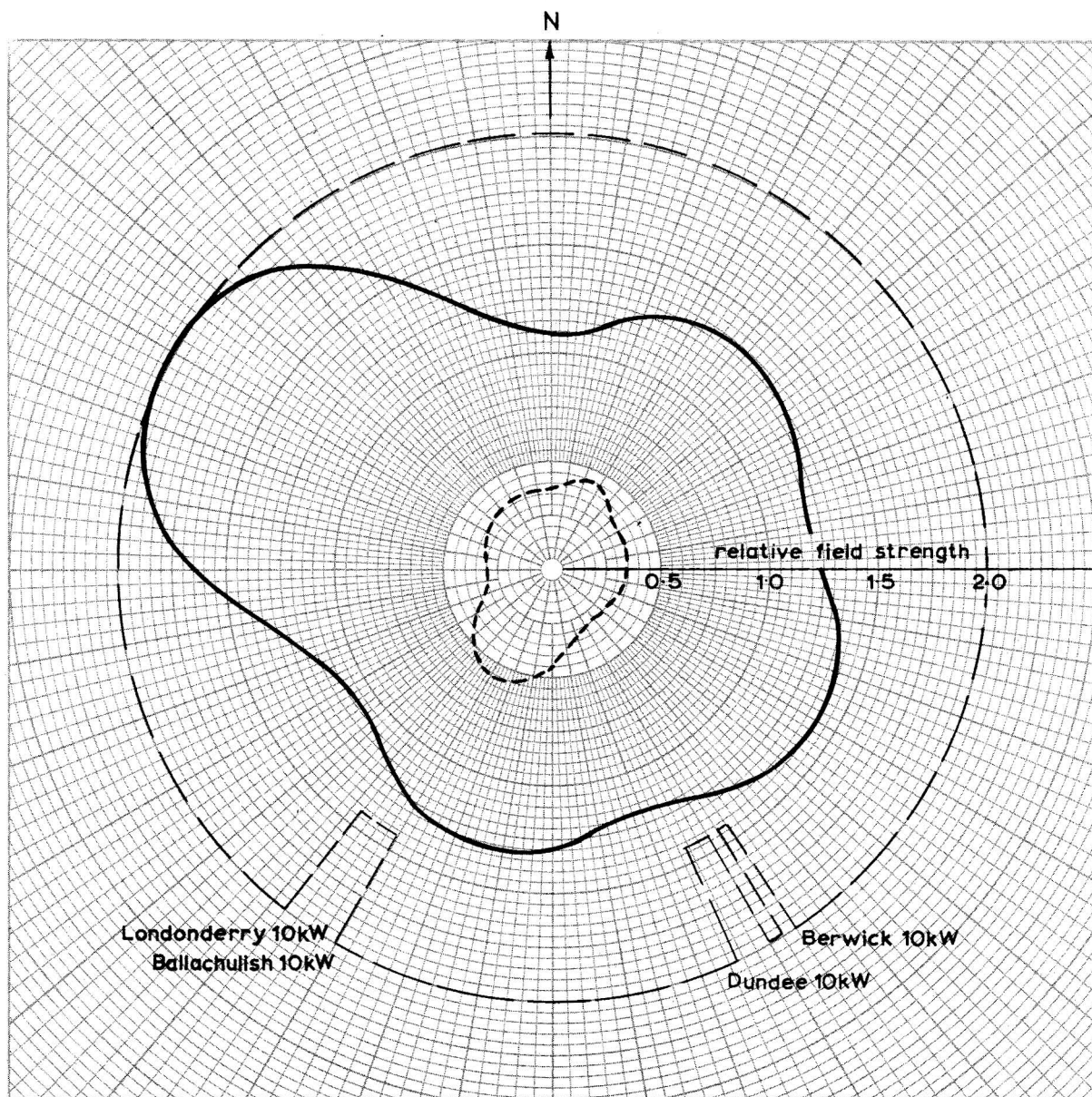


Fig.2 Templet and horizontal radiation pattern of Band I aerial
HORIZONTAL POLARIZATION

Channel 2 (Vision carrier 51.75Mc/s Sound carrier 48.25Mc/s)

Mean effective gain 5.2dB ——— Maximum permissible E.R.P.

Transmitter power 3.0kW ----- Original H.R.P.

Mean E.R.P. 9.9kW

Unit field corresponds to an E.R.P. of 5kW

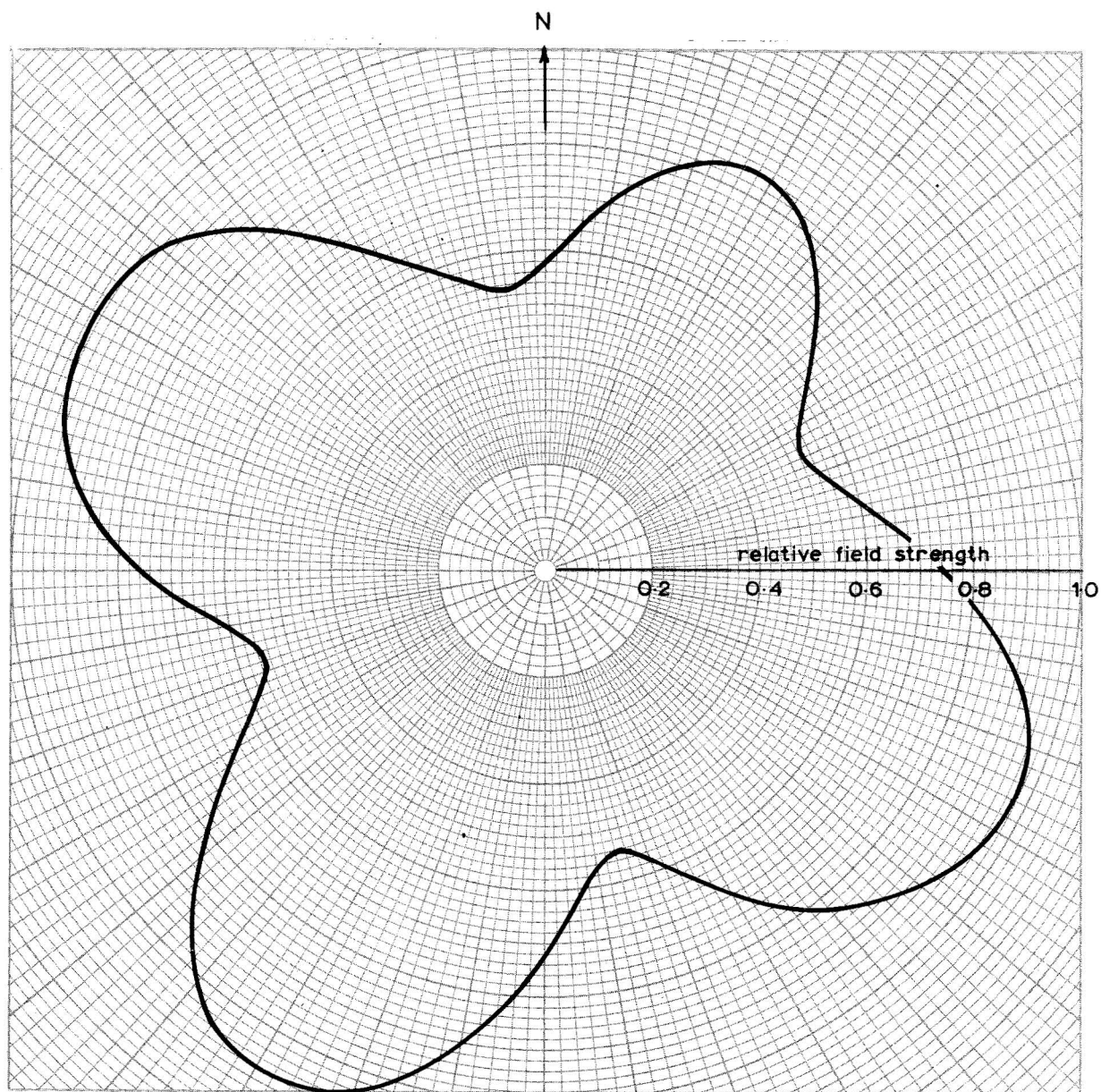


Fig.3 Horizontal radiation pattern of Band II aerial
 HORIZONTAL POLARIZATION
 89.6(Light), 91.8(Third), 94.0(Scottish Home)Mc/s
 Mean effective gain 4.7dB Transmitter power 2 x1kW
 Mean E.R.P. 5.9kW
 Unit field corresponas to an E.R.P. of 10kW